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Lail et al.
SN 10/661,204
Submission Under 37 C.F.R. § 1.114

AMENDMENT(S) TO THE CLAIMS

1. (currently amended) An optical tube assembly comprising:
a tube, the tube having an interior surface;
at least one optical waveguide, the at least one optical waveguide being disposed in the tube; and
at least one dry insert, the at least one dry insert having a first layer and a second layer, the first layer being a polyurethane foam and the second layer being a water-swellable component layer, wherein the at least one dry insert is disposed within the tube adjacent to the interior surface of the tube and disposed about generally surrounds the at least one optical waveguide, thereby coupling the at least one optical waveguide with the interior surface of the tube.
2. (original) The optical tube assembly of claim 1, the at least one dry insert being compressed at least 10 percent or more for coupling the at least one optical waveguide to an interior surface of the tube.
3. (previously presented) The optical tube assembly of claim 1, the compression of the at least one dry insert being about 90% or less for coupling the at least one optical waveguide to the interior surface of the tube.
4. (original) The optical tube assembly of claim 1, the polyurethane foam being an open cell ether-based polyurethane foam.
5. (currently amended) The optical tube assembly of claim 1, the water-swellable component layer being a water-swellable tape.
6. (previously presented) The optical tube assembly of claim 5, the water-swellable tape having a first water-swellable component

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and a second water-swellable component.

7. (original) The optical tube assembly of claim 1, further comprising one or more materials selected from the group of adhesives, glues, elastomers, and polymers for attaching the at least one dry insert to the tube.

8. (original) The optical tube assembly of claim 1, the at least one optical waveguide being a portion of a fiber optic ribbon, the fiber optic ribbon having a positive excess ribbon length (ERL).

9. (original) The optical tube assembly of claim 1, the polyurethane foam having a density in the range of about 1 lb/ft³ to about 3 lb/ft³.

10. (previously presented) The optical tube assembly of claim 1, the at least one optical waveguide having a normalized pull-out force between about 0.5 N/m and about 5.0 N/m.

11. (original) The optical tube assembly of claim 1, the at least one optical waveguide having a normalized pull-out force between about 1 N/m and about 4 N/m.

12. (original) The optical tube assembly of claim 1, the at least one optical waveguide being a portion of a ribbon, the ribbon having a normalized ribbon pull-out force between about 0.5 N/m and about 5.0 N/m.

13. (original) The optical tube assembly of claim 1, the at least one optical waveguide being a portion of a ribbon, the ribbon having a normalized pull-out force between about 1 N/m and about 4 N/m.

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14. (original) The optical tube assembly of claim 1, the at least one dry insert having an uncompressed height h of about 5 mm or less.
15. (previously presented) The optical tube assembly of claim 1, the optical tube assembly being a portion of a fiber optic cable.
16. (previously presented) The optical tube assembly of claim 15, the fiber optic cable having a normalized ribbon coupling force between about 0.5 N/m and about 5 N/m.
17. (previously presented) The optical tube assembly of claim 1, the optical tube assembly being a portion of a fiber optic cable, the fiber optic cable having an armor tape.
18. (previously presented) The optical tube assembly of claim 1, the at least one optical waveguide being a portion of a ribbon stack having at least one corner optical waveguide, the at least one corner optical waveguide having a MAC number of about 7.35 or less.
19. (original) The optical tube assembly of claim 1, the tube being formed from a bimodal material.
20. (original) The optical tube assembly of claim 1, the at least one optical fiber having an excess fiber length.
21. (currently amended) An optical tube assembly comprising:
 - a tube, the tube having an interior surface;
 - at least one optical waveguide, the at least one optical waveguide being disposed within the tube and having a positive excess length compared with the tube; and
 - at least one dry insert, the at least one dry insert having at least two laminated layers disposed about generally

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surrounding the at least one optical waveguide, thereby forming a core that is disposed within the tube, the at least one dry insert comprising a compressible layer and at least one water-swellable layer, wherein the at least one dry insert acts to couple the at least one optical waveguide to the interior surface of the tube while cushioning the at least one optical waveguide, thereby maintaining an optical attenuation below about 0.4 dB/km at a reference wavelength of 1310 nm.

22. (cancelled)

23. (currently amended) The optical tube assembly of claim 21, the compressible layer being a polyurethane foam tape that is compressed by about 10% or more.

24. (currently amended) The optical tube assembly of claim 21, the compressible layer being a polyurethane foam tape that is compressed by about 90% or less.

25. (previously presented) The optical tube assembly of claim 21, one of the at least two laminated layers comprising an open cell ether-based polyurethane foam.

26. (previously presented) The optical tube assembly of claim 21, one of the at least two laminated layers being a water-swellable tape.

27. (previously presented) The optical tube assembly of claim 21, the at least one water-swellable layer having a first water-swellable component and a second water-swellable component.

28. (original) The optical tube assembly of claim 21, further comprising one or more materials selected from the group of adhesives, glues, elastomers, and polymers for attaching the at

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least one dry insert to the tube.

29. (original) The optical tube assembly of claim 21, the at least one optical waveguide having a normalized pull-out force between about 0.5 N/m and about 5.0 N/m.

30. (original) The optical tube assembly of claim 21, the at least one optical waveguide having a normalized pull-out force between about 1 N/m and about 4 N/m.

31. (original) The optical tube assembly of claim 21, the at least one optical waveguide being a portion of a ribbon, the ribbon having a normalized pull-out force between about 0.5 N/m and about 5.0 N/m.

32. (original) The optical tube assembly of claim 21, the at least one optical waveguide being a portion of a ribbon, the ribbon having a normalized pull-out force between about 1 N/m and about 4 N/m.

33. (original) The optical tube assembly of claim 21, the at least one dry insert having an uncompressed height of about 5 mm or less.

34. (original) The optical tube assembly of claim 21, the at least one optical waveguide being a portion of a fiber optic ribbon, the fiber optic ribbon having a positive excess ribbon length (ERL).

35. (previously presented) The optical tube assembly of claim 21, the compressible layer being a polyurethane foam having a density in the range of about 1 lb/ft³ to about 3 lb/ft³.

36. (previously presented) The optical tube assembly of claim

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21, the optical tube assembly being a portion of a fiber optic cable.

37. (previously presented) The optical tube assembly of claim 34, the fiber optic cable having a normalized ribbon coupling force between about 0.5 N/m and about 5 N/m.

38. (previously presented) The optical tube assembly of claim 21, the optical tube assembly being a portion of a fiber optic cable, the fiber optic cable having an armor tape.

39. (previously presented) The optical tube assembly of claim 21, the at least one optical waveguide being a portion of a ribbon stack having at least one corner optical waveguide, the at least one corner optical waveguide having a MAC number of about 7.35 or less.

40. (original) The optical tube assembly of claim 21, the tube being formed from a bimodal material.

41. (previously presented) The optical tube assembly of claim 21, the at least one optical waveguide having an excess fiber length.

42. (previously presented) An optical tube assembly comprising:
a tube;
at least one optical waveguide; and
at least one dry insert, the at least one dry insert having a polyurethane foam layer, wherein the at least one dry insert and the at least one optical waveguide form a core disposed within the tube, wherein the at least one optical waveguide has a normalized pull-out force between about 0.5 N/m and about 5.0 N/m when pulled from the at least one dry insert.

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43. (original) The optical tube assembly of claim 42, the normalized pull-out force being between about 1 N/m and about 4 N/m.

44. (original) The optical tube assembly of claim 42, the at least one optical waveguide being a portion of a ribbon, the ribbon having the normalized pull-out force.

45. (original) The optical tube assembly of claim 44, the normalized pull-out force of the ribbon being between about 1 N/m and about 4 N/m.

46. (currently amended) The optical tube assembly of claim 42, the at least one dry insert comprising an open cell ether-based polyurethane foam layer and at least one water-swellable member layer.

47. (currently amended) The optical tube assembly of claim 46, the water-swellable member layer being a water-swellable tape.

48. (original) The optical tube assembly of claim 42, the polyurethane foam layer being compressed by about 10% or more.

49. (original) The optical tube assembly of claim 42, the polyurethane foam layer being compressed by about 90% or less.

50. (currently amended) The optical tube assembly of claim 42, the dry insert further comprising a water-swellable member layer having a first water-swellable component and a second water-swellable component.

51. (previously presented) The optical tube assembly of claim 50, the first water-swellable component being effective for ionized liquids and the second water-swellable component being

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effective for non-ionized liquids.

52. (original) The optical tube assembly of claim 42, further comprising one or more materials selected from the group of adhesives, glues, elastomers, and polymers for attaching the at least one dry insert to the tube.

53. (original) The optical tube assembly of claim 42, the at least one dry insert having an uncompressed height of about 5 mm or less.

54. (previously presented) The optical tube assembly of claim 42, the optical tube assembly being a portion of a fiber optic cable.

55. (previously presented) The optical tube assembly of claim 54, the fiber optic cable having a normalized ribbon coupling force between about 0.5 N/m and about 5 N/m.

56. (original) The optical tube assembly of claim 42, the at least one optical waveguide being a portion of a fiber optic ribbon, the fiber optic ribbon having a positive excess ribbon length (ERL).

57. (previously presented) The optical tube assembly of claim 42, the polyurethane foam layer having a density in the range of about 1 lb/ft³ to about 3 lb/ft³.

58. (previously presented) The optical tube assembly of claim 42, the optical tube assembly being a portion of a fiber optic cable, the fiber optic cable having an armor tape.

59. (previously presented) The optical tube assembly of claim 42, the at least one optical waveguide being a portion of a

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ribbon stack having at least one corner optical waveguide, the at least one corner optical waveguide having a MAC number of about 7.35 or less.

60. (original) The optical tube assembly of claim 42, the tube being formed from a bimodal material.

61. (currently amended) The optical tube assembly of claim 1, the at least one dry insert at least partially contacting the at least one optical waveguide or a fiber optic ribbon.

62. (currently amended) The optical tube assembly of claim 21, the at least one dry insert at least partially contacting the at least one optical waveguide or a fiber optic ribbon.

63. (currently amended) The optical tube assembly of claim 1, the polyurethane foam first layer facing the at least one optical waveguide.

64. (currently amended) The optical tube assembly of claim 1, the at least one dry insert being a longitudinal tape disposed wrapped about the at least one optical waveguide.

65. (previously presented) The optical tube assembly of claim 21, the compressible layer facing the at least one optical waveguide.

66. (previously presented) The optical tube assembly of claim 65, the compressible layer being a foam.

67. (currently amended) The optical tube assembly of claim 42, the core further including at least one dry insert having a water-swellable member portion.

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68. (currently amended) The optical tube assembly of claim 42, the at least one dry insert being a longitudinal tape disposed wrapped about the at least one optical waveguide.

64. (new) The optical tube assembly of claim 21, the at least one dry insert being a longitudinal tape disposed about the at least one optical waveguide.